

# DEADLY SOUNDS

## DR GAVREAU'S INFRASONIC WEAPON

*Observations of the harmful effects of infrasonic vibrations led French robotics scientist Dr Vladimir Gavreau to develop infrasound detectors, weapons and shields.*

by Gerry Vassilatos © 1996

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It was masterfully macabre: black foundations, blue pillars and rainbow ceilings; sound, rhythm and space. Ultra-chromatic chord frames rose like rock walls from the black depths, and immense stellar crystallisations radiated tonal perfumes through deep, black, radiant space. Lovely, lyrically swooping melodies reached up towards unknown depths of space. Each had its foundation in ultrabass tones of rooted depth. The *basso profundo* of Messiaen was the critical foundation, supporting the strong pillars of an immense architecture which extends beyond performance walls.

Olivier Messiaen, the master composer, used the ground-thrumming tones of great Parisian cathedral organs to evoke sensations which may only be called otherworldly. He scoured the deep and unreachable roots of worlds to hold his musical cathedrals together. Such majesty and grandeur of sound! It was rich in the intelligence which flooded and made the world, the musical currents and the atmosphere of tones; fluidic music and meaning.

Yet, the most fundamental signals which permeate this world are inaudible. They not only escape our hearing, but they undergird our being. Natural infrasounds rumble through our experience daily. Their manifestations are fortunately infrequent and incoherent. Infrasound is inaudible to human hearing, being of pitch below 15 cycles per second—the bottom human limit, the plinth, the foundation. Infrasound is not heard, it is felt. Infrasound holds a terrible secret in its silent roar.

Infrasound produces varied physiological sensations which begin as vague "irritations". At a certain pitch, infrasound produces physical pressure; at specific low intensity, it produces fear and disorientation. Nazi propaganda engineers methodically used infrasound to stir up the hostilities of crowds who were gathered to hear their madman. The results are historical nightmares. At a very specific pitch, infrasound explodes matter; organisms rupture in its blast. At other pitches, infrasound incapacitates and kills. Sea creatures use this power to stun and kill prey.

The swelling bass tones of the cathedral seem as though they can burst the very pillars which uphold the vaults. Stained glass windows have been known to erupt in a shower of coloured fragments from the organ's *basso profundo*. Somewhere in the almost inaudible roll of these basement sounds, these impulsive ultrabass tones, this thunder, there was a devastating and fearful power.

### INFRASOUND GENERATED BY NATURAL PHENOMENA

Natural phenomena—thunder, earthquakes, volcanic eruptions, ocean waves, waterfalls, winds and auroras—are prodigious generators of infrasound.

The potent distal effects produced when natural explosions occur produce legendary effects. When Krakatoa exploded, windows were shattered hundred of miles away by the infrasonic wave. The "ringing" of both earth and atmosphere continued for hours. It is believed that infrasound actually formed the upper pitch of this natural volcanic explosion, tones unmeasurably deep forming the actual "central harmonic" of the event. The island of Krakatoa was literally lifted into orbit in the fatal blast.

Analysts contend that infrasound is composed of a very broad band of pitches. These tones of immense pressure and duration "accommodate" themselves when encountering resonant cavities. All such resonant cavities are "found and destroyed" when the proper pressure waves flow into their resonances. Infrasound is the cruel tonal giant, tearing open whatever it finds in its path.

Studies reveal that the sudden shock of an explosion propels a complex infrasonic

signal far beyond the shattered perimeter. Incoherent though such shockwaves may be, their destructive influence dissolves distant walls and windows seconds after the shrapnel has done its deadly work. Objects of all shapes, sizes and compositions explode when the infrasonic impulse passes through their space. No shield can block infrasound. Physicists have studied the refuse which remains after an explosive charge has been detonated. Few materials can maintain their integrity. Those objects which manage to survive explosions are noteworthy as infrasonic "resistors". Screen-reinforced concrete does not easily succumb to the infrasonic blasts of explosive charges.

Certain earthquake activities produce large and virtually insensate vertical displacements of the ground surface, in extreme instances amounting to a few feet per pulse. In this case, the ground becomes like the surface of a drum, ringing out its deadly cadence at infrasonic pitch, hours before the event. The ground undulates with infrasonic tones, an elasticity that eventually cracks under the heaving stress.

These ultralow-pitch earthquake sounds are keenly felt by animals and sensitive humans. Indeed, infrasonic shocks produce characteristic pressure effects on structures and organisms alike.

The sensation flattens the body; it is as if one were struck with a solid invisible wall from which there is no escape. Anxiety, fear, extreme emotional distress and mental incapacitation are all part of the unpleasant phenomenon. Notable among human exposures to quake-correlated infrasound is the precursory nausea which many report; this strong sensation leaves its more sensitive victims helpless.

Ocean waves which pound the atmosphere across huge areas produce an acoustic energy with a mean pitch of 16 cycles per second. The phenomena of "barisal guns", "fog guns" and "lake guns" form a well-documented bibliography of anomalous acoustic phenomena. Some of these "booming" tones manifest at haphazard intervals, but others are periodic. Bay sizes, wave sizes, the geologic compositions of bays and shores have been woven into complex mechanistic attempts at explaining how these mystery sounds are being generated in certain environments. These natural bay tones have great infrasonic content. These booming sounds have rattled windows and rocked some small towns.

However, mysterious and sudden barometric variations indicate that natural infrasonic generation has a much wider source than the subterranean earth or bodies of water. Both solar flares and the normal thrummings of the solar wind generate infrasonic pulses throughout the atmosphere. Aerial earthquake sounds have been reported by observers. Typical of infrasound, the sources cannot be accurately located. The high-pitched sizzling sounds of the aurora borealis are augmented by deep and ominous thrumming. These deep tones sweep through the bodies of listeners, and these permutations produce an irritability and a dizzying nausea. The infrasonic shockwaves of the aurora are normally not heard, but definitely sensed.

Infrasound moves, unaffected, through and across both winds and storms, but these too can generate infrasound. The powerful harmonic rotations of storms shear the atmosphere, radiating a cyclonic series of expanding infrasounds. The sense of impending fear which precedes hurricanes is due to infrasonic emissions.

The infrasound of seasonal winds and weather patterns produces illness in certain persons. Symptoms include anxiety and depression, emotional tension, irritability, disorientation, accident-proneness, nausea and diarrhoea.

Infrasound travels long distances with virtually no attenuation. Its pressures thus arrive at great distances with the same force and intensity as when generated. The atmosphere sustains prolonged and powerful infrasonic vibrations. Not much acoustic power is required for infrasound to produce such extreme and sustained physiological and psychological symptoms.

## EFFECTS OF MACHINE VIBRATIONS

Vibrating man-made structures stimulate the artificial generation of dangerous infrasound. When turns are made at 60 miles per hour [96.6 kph], car chassis vibrations produce a peak infrasonic emission. Travel sickness can be associated with prolonged infrasonic exposure to any vibrating chassis. Cars, buses, trains, motorcycles and jets alike, each register hazardous intensities of infrasound. Each transportation mode has its characteristic infrasonic pitch, the necessary outcome of mechanical frictions and inertial resistances.

There is difficulty in recording and reproducing ultradeep tones for study and analysis. They have to be generated on site for experimental purposes. Theatre-sized sound systems can never completely transmit all of the sensations associated with naturally occurring infrasound. But there have been instances where audiences have become frighteningly ill because of the accidental generation of infrasound in a theatre space.

Of critical importance is the comprehension of human tolerances to infrasound. Military medical teams have long studied the effect of

machine vibration on human judgement and behaviour out of necessity. If jet pilots and rocket pilots alike evidence even minor errors in judgement through their exposure to infrasound, disaster can result. Certain critical errors in judgement and accuracy have in fact been noted during short flight times.

The powerful infrasonic vibrations of jet chassis absolutely saturate the bodies of pilots. Continually saturated with these infrasonic energies throughout their flight time, pilot reflexes are severely diminished. Military procedure recognises this factor, and routinely limits flight time. It is known that excess infrasonic exposures endanger pilots and their flight missions. Pilot-damaging effects include decrements in vision, speech, intelligence, orientation, equilibrium and the ability to discern situations accurately and make reasonable decisions.

## DEADLY COLD WAR WEAPONRY

The Cold War was on. The United States alone held the dreaded secret. The most terrible weapon yet developed was the private property of one government. The mere existence of the atomic bomb was a threat to nations whose motives were not entirely altruistic.

Obtaining atomic bomb data was a priority for several motivated, aggressive and imperialistic nations. The only manner in which some nations obtained the secret was by stealing it. When Stalin's science officers finally developed a duplicate of the American atomic bomb, pressure suddenly was placed upon every

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other European nation to create an equivalent or better device.

When one seeks to defend one's borders, the consequences of releasing weapons of devastation to the world do not seem important. Weaponry is death-oriented by nature. But there are moral differences between weapons of defence and weapons of offence.

Previous to this atomic proliferation, competing nations concentrated their weapons research on truly bizarre and equally deadly means for defending their national boundaries. Perfected in rapid succession were deadly variations and combinations of gas weaponry, pathogenic agents and radiant weaponry. Stalin's research teams investigated psychic powers as a possible means of destroying an enemy. Psychotronic warfare was developed among numerous groups, both private and national, with measurable success. Information on some simpler psychotronic weapons has recently been obtained through an increasing process of Soviet disclosure.

In truth, the larger the weaponry, the less safe were the national boundaries. While the superpowers concentrated their weapons development programs on mass-destructive nuclear weaponry, others focused on more practical, conventional weapons which seemed to fill an immediate need in the limited tactical warfare of small battlefields.

While developing its own atomic device, France sought defensive tactical weaponry on every possible technological front. Short-range weapons would best defend against a conventional national assault. But other systems were also sought—systems which, though non-nuclear, were equally invincible. As the great mediaeval Frankish knight Charles "the Hammer" Martel repelled ruthless invaders from the East, so a new hammer would be sought to defend France against possible new enemies. Even as Charles Martel arose from obscurity, so this strange new "hammer" would arise in equal obscurity.

#### **DR VLADIMIR GAVREAU**

The central research theme of Dr Vladimir Gavreau was the development of remote-controlled automatons and robotic devices. To this end, he assembled a group of scientists in 1957 [at the Electro-Acoustical Laboratory in Marseille, France]. The group, including Marcel Miane, Henri Saul and Raymond Comdat, successfully developed a great variety of robotic devices for industrial and military purposes.

In the course this development, Dr Gavreau and his staff made a strange and astounding observation which not only interrupted their work but became their major research theme. Housed in a large concrete building, the entire group periodically experienced a disconcerting nausea, often day after day, for weeks at a time. Industrial examiners who were called to inspect the situation also fell victim to the malady. It was thought that the condition was caused by pathogens—a "building sickness". No such biological agencies were detected, yet the condition prevailed. Their research schedules now seriously interrupted, the team called for a complete examination of the building.

The researchers had noticed that the mysterious nausea ceased when certain laboratory windows were blocked. It was then assumed that "chemical gas emissions" of some kind were respon-

sible for the malady, and so a thorough search of the building was undertaken. While no noxious fumes could be detected by any technical means, the source was finally traced by building engineers to an improperly installed motor-driven ventilator. The engineers at first thought that this motor might be emitting noxious fumes, possibly evaporated oils and lubricants, but no evaporated products were detected. They then found that the loosely supported low-speed motor, poised in its cavernous duct of several storeys' height, was developing "nauseating vibrations".

The mystery magnified for Dr Gavreau and his team when they tried to measure the sound intensity and pitch. Failing to register any acoustic readings at all, the team doubted the assessment of the building engineers. Nevertheless, closing the windows blocked the sense of nausea.

In a step of brilliant scientific reasoning, Gavreau and his colleagues realised that the sound they were dealing with was so low in pitch that it could not register on any available microphonic detector. This was costly to the crew; they could not pursue the "search" for long time-periods. In fact, during the very course of tracking down the sound, an accidental direct exposure rendered them all extremely ill for hours.

When they finally managed to measure the "sound", they found that a low-intensity pitch of a fundamental seven cycles per second was being produced. Furthermore, this infrasonic pitch was not one of great intensity. It became obvious that the slow-vibrating motor was activating an infrasonic resonant mode in the large concrete duct.

Operating as the vibrating "tongue" of an immense "organ pipe", the rattling motor produced nauseating infrasound. Coupled with the rest of the concrete building—a cavernous industrial enclosure—the vibrating air column formed a bizarre infrasonic amplifier.

Knowledge of this infrasonic configuration also explained why shutting the windows was mildly effective in "blocking the malady". The windows altered the total resonant profile of the building, shifting the infrasonic pitch and intensity.

Since this time, others have noted the personally damaging effects of such infrasonic generation in office buildings and industrial facilities. The nauseating effects of exposure to a low-intensity natural or man-made infrasonic source is now well appreciated. It has become a routine architectural procedure to seek out and alter any such possible resonant cavities. The sources often appear in older buildings, the result of construction rendered faulty by previous lack of this knowledge. All such "improper" architectural formats are modified by the addition of sound-blocking materials.

#### **EXPERIMENTS WITH INFRASONICS**

Dr Gavreau and his research team now carefully investigated the effects of their "infrasonic organ" at various intensity and pitch levels. By changing the spring tension on the shock mounts which held the fan motor, it was possible to change the pitch. Various infrasonic resonances were established throughout the large research building. Shutting the windows blocked most of the symptoms, but opening them again, however weak was the

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source, made the team feel the nauseating effects once more.

In the business of military research, Dr Gavreau believed he had discovered a new and previously "unknown weapon" in these infrasounds. Aware of the natural explosives by which infrasonics are generated, Dr Gavreau began to speculate on the application of infrasonics as a defence initiative. The haphazard explosive effects of natural infrasound in thunderclaps were quite effective in demonstrating what an artificial "thunder-maker" could do—but how could a thunderclap be artificially generated in a compact system? These thoughts stimulated theoretical discussions on the possibility of producing coherent infrasound—an infrasonic "laser".

The first devices Dr Gavreau implemented were designed to imitate the "accident" which first made his research group aware of infrasonics. The team designed real organ pipes of exceedingly great width and length, the first of these being six feet in diameter and 75 feet long. Two forms of these infrasonic organ pipes were built: the first utilised a drive piston which pulsed the pipe output, while the second utilised compressed air in a more conventional manner. These designs were tested outdoors, securely propped against protective sound-absorbent walls, while the investigators stood at a great distance.

The main resonant frequency of these pipes was found to be in the "range of death", between three and seven cycles per second. These sounds could not be humanly heard—a distinct advantage for a defence system. However, the effects could be felt.

Even though the pipes were operating for only a few seconds, symptoms in the investigators came on rapidly and unexpectedly. The pressure waves impacted against the entire body in a terrible and inescapable grip—a pressure which came in on the body from all sides simultaneously, an envelope of death. Next came the pain—dull, infrasonic pressure against the eyes and ears. Then came a frightening manifestation on the material supports of the device itself. With sustained operation of the pipes, a sudden rumble rocked the area, nearly destroying the test building. Every pillar and joint of the massive structure moved. One of the technicians managed to ignore the pain enough to shut down the power supply.

These experiments with infrasonics were as dangerous as those early investigations of nuclear energy, but infrasonic assaults on the body are the more lethal because they come with a dreadful silence. Dr Gavreau and his associates were dangerously ill for nearly a day after these preliminary tests were performed. Their eyesight was affected for days. More dangerously, their internal organs were affected: the heart, lungs, stomach and intestinal cavity were filled with continual painful spasms for an equal time period. Musculature convulsions, torques and tears were the symptoms of their infrasonic exposure. All the resonant body cavities absorbed the self-destructive acoustic energy, and would have been torn apart had the power not been extinguished at that precise moment.

The effectiveness of infrasound as a defensive weapon of frightening power having been demonstrated "to satisfaction", more questions were asked. After this dreadful accident, approaching the equipment once again was almost a fearful exercise. How powerful could the output of an infrasonic device be

before it affected even the operating engineers?

With greatest caution and respect for the power with which they worked, Dr Gavreau began recalculating all of his design parameters. He had grossly misjudged the power released by the pipes; in fact, he had greatly lowered those calculated outputs for diagnostic purposes. Never had he imagined that these figures were actually far too great in the world of infrasound!

Empirical data collection and analysis being the only way to determine how infrasonic energy correlated with both biological and material effects, the tests were again attempted with a miniature power supply. First, the dimensions of these devices had to be greatly reduced; their extreme length was objectionable. In order to provide absolutely safe control of the deadly blasts, several emergency cut-off switches were provided. These responded to the radiated infrasonic pressure wave. The intensity could be limited by the use of automated barometric switches.

In an attempt to produce more compact and controllable infrasound generators, Dr Gavreau designed and tested special horns and whistles of various volumes. These were each remarkably simple, flat, circular, resonant cavities, having a side output duct. They were simply the large analogues of foghorns and police

whistles. These flat forms were volumetrically reduced in successive design stages because it was found that their output was far too great. The infrasonic foghorns could produce a frightening two kilowatts of infrasonic energy at a pitch of 150 cycles per second. The flat "police whistles" were more easily designed to the required specifications. Their overall characteristics were quite simple to determine, a mathematical formula being devised for the purpose. The whistle's resonant pitch was found by dividing its diameter into a numerical constant of fifty-

one. Increasing the depth of the whistle effectively increased its amplitude. A whistle 1.3 metres in diameter produced an infrasonic pitch of 37 cycles per second. This form violently shook the walls of the entire laboratory complex, though its intensity was less than two watts of infrasonic power.

#### TESLA'S RESEARCH AND MILITARY MEDICAL TESTS

Not much amplitude is required for infrasound to produce physiological malady. Several researchers accidentally did themselves great harm when, either by deliberate intent or accident, they succeeded in generating infrasonic vibrations.

Dr Nikola Tesla used vibrating platforms as an aid to vitality. He delighted in "toning the body" with vibrational platforms of his own design. Mounted on heavy rubber pads, these platforms were vibrated by simple, motorised, "eccentric" wheels. Their mild use, for a minute, could be pleasantly stimulating, the effects invigorating the whole body for hours thereafter. However, their excessive use would produce grave illness, extreme aggravations of the heart being the most dangerous aspect of the stimulation. The entire body would "ring" for hours with an elevated heart rate and greatly stimulated blood pressure. The effects could be deadly.

In one historic instance, Samuel Clemens, Tesla's close friend, refused to descend from the vibrating platform after repeated warnings. Tesla was sorry he had allowed him to mount it, but his concern was drowned out by both the vibrating machine and Clemens's jubilant exaltations and praises. Several more seconds

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and Clemens nearly soiled his white suit. The effects of the infrasound were duly recorded.

Tesla often went to great lengths in describing the effects of infrasound to newspaper reporters who, behind his back, scoffed at the notion that a "little sound" could effect such devastation. Yet, it was precisely with such "little sound" that Tesla nearly brought down his laboratory on Houston Street. His compact infrasonic impulsive weapons were terribly efficient. Tesla later designed and tested infrasonic impulse weapons capable of wrecking buildings and whole cities on command.

Walt Disney and his artists were once made seriously ill when a sound effect, intended for a short cartoon scene, was slowed down several times on a tape machine and amplified through a theatre sound system. The original sound source was a soldering iron, whose buzzing 60-cycle tone was lowered five times to 12 cycles. This tone produced nausea in the crew, which lasted for days.

Physiology seems to remain paralysed by infrasound. Infrasound stimulates middle ear disruptions, ruining organismic equilibrium and immobilising its victims. The effect is like severe, prolonged seasickness. Restoration to normal vitality requires several hours or even days. Exposure to mild infrasound intensities produces illness, but increased intensities result in death.

Alarming responses to infrasound in the 40 to 100 cycles range have been accurately recorded by military medical experts, and the results are sobering. As infrasonic pitches decrease, the deadly symptoms increase. Altered cardiac rhythms, with pulse rates rising to 40 per cent of their rest values, are the precursors to other pre-lethal states. Mild nausea, giddiness, skin flushing and body tingling occur at 100 cycles per second. Vertigo, anxiety, extreme fatigue, throat pressure and respiratory dysfunction follow. Coughing, severe sternal pressure, choking, excessive salivation, extreme swallowing pains, inability to breathe, headache and abdominal pain occur between 60 and 73 cycles per second. Post-exposure fatigue is marked. Certain subjects continue to cough for half an hour, while many continue the skin-flush manifestation for up to four hours. Significant visual acuity decrements are noted when humans are exposed to infrasound between 43 and 73 cycles per second. Intelligibility scores for exposed persons fall to a low of 77 per cent of their normal scores. Spatial orientation becomes completely distorted. Muscular coordination and equilibrium falter considerably. Depressed manual dexterity and slurred speech have been noted before individuals black out. Just before this point, a significant loss in intelligibility is noted.

The findings of Dr Gavreau in the infrasonic range between one and 10 cycles per second are truly shocking. Lethal infrasonic pitch lies in the seven-cycle range. Small amplitude increases affect human behaviour in this pitch range. Intellectual activity is first inhibited, blocked and then destroyed. As the amplitude is increased, several disconcerting responses occur as a result. These responses begin as complete neurological interference. The action of the medulla is physiologically blocked; its autonomic functions cease.

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## EXPERIMENTS WITH INFRASOUND DETECTORS

Infrasound clings to the ground, a phenomenon well known in the animal world. Female vocalisations and those of their young take their traceable routes through the air. High-pitched sounds are aerial in nature. This means that females and their young are natural targets for predators. Low-pitched tones cling to the ground, being "guided" along the soil layers. Male sounds cannot be localised by predators because they "hug" the ground, diffusing out from their source. Some males rumble the ground with their calls and hooves. These are communications signals which they alone comprehend.

The fact that the ground draws and guides low-frequency tones is a remarkable gift to the animal kingdom, enhancing the survival of male leaders. When herds are attacked by predators, the males can continue to give guidance to their companions, while remaining completely "invisible" and elusive. Predators cannot locate the calls and rumblings of male leaders because their low-pitched signals are impossible to pinpoint. They are therefore also impossible to attack. Predators are often overtaken by the males who maintain their diffusive communications across and through the ground.

The same analogies would apply to an infrasonic defence system. First, infrasound does not lose its intensity when travelling very long distances across the ground; it remains at the same intensity as when released from its deadly source. Also, because of the ground-clinging effect, infrasonic sources cannot be located without special appliances. This would work well for

those who used the weaponry of infrasound. But suppose some hostile force was itself using infrasonics? Infrasonics are inaudible. The battle would be over before anyone knew it had begun. How would one know of an infrasonic attack? The first line of defence therefore would be the detection of the "unperceived enemy". The development of an adequate infrasonic weapons systems would first require an infrasound detector.

Dr Gavreau first concentrated on developing infallible infrasonic detectors for the personal safety of his oper-

ators, and then for eventual tactical deployment. He experimented with several designs which followed the arcane analogues of old wireless detectors. One such design used enclosed flames to detect infrasonic pitches. They were reminiscent of those flame detectors developed by Lee de Forest just before his invention of the triode. Gavreau's flame detectors employed variable resonant cavities, the flame amplitudes shifting with specific infrasonic pitches. He could calibrate the infrasonic intensity as well as the pitch with these detectors. But flames are dangerous and fickle, and not very reliable in battle.

Dr Gavreau next experimented with enhanced mechanical barometers. These coupled large resonant cavities with very fine barometer tubes. They displayed great sensitivity. Steady increases in barometric pressure were registered when large cavity bellows were compressed by infrasound. The sensitivity of these barometers increased as the bellows' capacity was increased. They were adequate, but frail.

Another embodiment resembled the early mechanical television designs of John Logie Baird. It utilised large timpani skins, mirrors, lights and photocells. A mirror was fastened to the timpanum, and a light beam would flicker when infrasound struck the mirror. The photocell recorded these flickers as an electrical signal. This detector system was very reliable.

By far the most advanced detectors which Gavreau designed and tested utilised an electrolytic process. In this analogue of systems developed by Fessenden to measure faint wireless signals, chemical solutions and fine wirepoint electrical contacts were used. Chemical solutions, separated by an osmotic barrier, were forced to migrate through the barrier whenever infrasound traversed the system. This chemical mixture was then measured as an increased electrical conductivity in a sensitive galvanometer. This system was reliable and accurate.

However, all of these systems suffered from one problem: the offensive use of an incredible infrasonic amplitude would burst them into vapour.

## DEFENCE AGAINST INFRASOUND

Statements were issued by the French authorities, to the effect that Dr Gavreau was not developing weapons at all. Several patents, however, betray this conspicuous smokescreen. While it is impossible to retrieve the actual patents for the infrasonic generators, Dr Gavreau is credited with extensive development of "infrasonic armour". Why would he "waste" such time and expense if not for an anti-weapons program?

Thus use of infrasonic weaponry necessitates the development and implementation of infrasonic shields. Dr Gavreau spent more time developing infrasonic shields than on developing efficient infrasonic horns. Infrasound could not be blocked adequately, as Dr Gavreau discovered early in his research. Infrasonic devices require extremely large baffles. Furthermore, no one would dare initiate an infrasonic barrage on any invasive force without adequate protection. Infrasonic horns can project their sounds in a given direction, but natural environments "leak" portions of the sound in all directions. Infrasonds saturate their generators, flooding and permeating their sources in a few seconds. They "work their way back" towards those who dispatch their deadly signals. Infrasonds "hug" the ground and spread around their sources. Unfortunately, those who would release infrasonic energy would themselves be slaughtered in the very act.

Gavreau's first method involved the conversion of infrasound into successively higher pitches until the infrasonic pitch was "lost". This was achieved in his passive "structural" method—an enormous, layered series of baffles and resonant cavities. This form is "passive", since it merely stands and waits for infrasonic barrages, absorbing and converting them into harmless audible tones.

His second method was more "aggressive", actively engaging and nullifying any offensive infrasonic power. The nullifier uses a well-known physical principle in its operation. As an "active" shield, it transmits tones whose opposing wavefronts destructively interfere with incoming infrasound. Infrasonic attacks are nullified, or at least brought to much weaker levels. This method requires high-speed detection and response systems. The process

involves determination of an attack pitch, generation of the same, and projection of the pitch "out of phase". The active nullifier method is not completely accurate or protective by any means. A highly modulated, mobile infrasonic source would be nearly impossible to neutralise successfully without extremely sophisticated electronics.

But Gavreau imagined an elegantly simple approach—one which would not require the defender to be exposed to his own infrasonic projections. While fixated on the old notion of gun installations and stations, Gavreau and the team had momentarily forgotten their first research endeavour: robotics!

## ROBOT-DELIVERED INFRASONIC WEAPONRY

Let us recall that Dr Gavreau and his team of pioneers were in the business of robotics, and developed industrial and military automaton systems. How difficult would it have been to couple his newfound weaponry with robotic applications?

Dr Gavreau combined the organ pipe and whistle format. The device was housed in a concrete block, less than a cubic metre in volume. The primary whistle was poised within its interior. At

its flared opening were placed several resonant pipes. The device was operated by highly compressed air, and its output was frightful. In a conventional engagement, it would be capable of utterly destroying an aggressor. For one experiment, this infrasound whistle set-up was sealed in an 880-pound [400-kg] concrete pier, with a concrete baffle placed over its projective end. Even with these precautions, the device succeeded in absolutely shaking a fan-shaped portion of Marseille. It broke through its supportive concrete pier and destroyed the baffle-covering in an

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instant. Macabre! No sound was ever heard. This design demonstrated great pitch selectivity, power and directionality.

In this last feature, Gavreau and his team achieved a safety factor of greatest value. Infrasonic defensive armaments could now be safely directed away from the operators. This weapon was a remarkably compact and efficient device. Its efficiency was gauged by the destructive output and the weapon's volume.

A later embodiment of this terror disclosed another compact cube. The infrasonic whistle was presumably housed therein. Proceeding from the front plate were some 60 pipes, with flared horns aimed in a deadly forward array. It was said that this device alone, remotely guided into an arranged artificial battlefield, burst open heavy battlements and tank interiors with hideous effortlessness. In addition, several other more frightening and unmentionable disruptions of equal effectiveness were observed. In each instance, not a sound was heard.

The device was mounted on a mobilised robotic vehicle, powered by diesel engines or compressed gas. The almost insignificant unit would be a bizarre foe for an army to engage. As defensive weaponry, such a device would be terrible and effective. The system would be a true deterrent for those who would be foolish enough to attempt a ground assault on any nation so armed. Armies would fall flat. Once the infrasonic horns were unleashed against the foe, the battle would not even begin. Such a war engine would be impossible to locate. None

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## Deadly Sounds: Dr Gavreau's Infrasonic Weapon

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who saw its size would believe it to contain such lethal power. Most would overlook the device completely. A flood of such devices, each emanating a peculiar, highly modulated blend of infrasound, would be an unstoppable wall. Robotic tanks equipped with infrasonic generators could sweep an area with deadly infrasound, destroying all opponents to within a five-mile radius. These terrifying infrasonic weapons could easily be secured in drone jets, where aerial assaults could quickly and methodically waste any approaching army on the offensive.

Deterring would-be aerial attackers could be equally devastating for the offenders. Infrasonic beacons could sweep and scan the skies with lethal accuracy. Infrasound passes through all matter with equal effectiveness, seeking out offenders with deadly consequence.

The intensities which the Gavreau devices effectively broadcast into the environment are frightening. In these devices, we see the perfection of phenomena which never naturally occur in such dangerous intensities. This is why these weapons—if

used at all—must be deployed by remote control, operating as automatons at great distances from their operators.

In Gavreau's own words: "There does not exist complete protection against infrasound. It is not absorbed by ordinary matter; walls and chambers do not suffice to arrest it."

And so, once again, we stand at the crossroads. We are called, summoned to appear before two pathways. On the one, we hear Messiaen and the musical messages of peace; on the other, Gavreau and the musical messages of war. And again we choose. And again we *must* choose. Whose music will it be?

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### Editor's Note:

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